MISCELLANEOUS: TABLE OF BRIDGES HAVING LONG SPANS--.Trussed Bridges Suspe
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MISCELLANEOUS.

HEAT NECESSARY TO IGNITE VAPORS.—W. R. Hutton, of Glasgow, has recently determined the degree of heat at which the vapors of a number of liquids catch fire from a burning candle, when it approached to the surface of the fluid at a distance of 1.5in. or 0.5in. The results of these experiments are recorded in the subioined table:

	Specific weight.	Inflaming Point in Degs. of Fah.	
		At a distance of 1.5in.	At a distance of 0.5in.
	Deg.	Deg.	Deg.
Sulphuric ether	747	Below 53	....
Bisulphide of carbon	1.270	do 53	....
Petroleum benzine	706	do 53	....
Benzole from coal tar, 90 per ct.	861	do 74	71
Crude paraffin oil	849	do 74	72
Crude naphtha	884	do 78	74
Whisky	940	do	85
Wood naphtha	9.840	do 87.8	81
Crude paraffin oil	891	do 89	84.2
Crude naphtha	881	do 90	86
Dutch gin	930	do	90
Wood spirit	827	do 96.8	84.2
Illuminating naphtha	859	do 100	91
Wine spirit	817	do 104	73
Whisky, 15 overproof	893	do 109	83
Whisky, 11 overproof	905	do 110	84.2
Kerosene	801	do 118	110
Light oil from coal tar	920	do 119	109
Spirit from resin	922	do 122	105.8
Turpentine	875	do 130	119
Sherry wine	993	do	130
Port wine	1.003	do	130
Refined paraffin oil	809	do 134	123
Refined paraffin oil	814	do 138.2	127
Fusel oil	850	do 140	129.2
Oil from resin	987	Above 212	....
Heavy tar oil	950	do 212	....

STREET WASHING AND SWEEPING.—The following practical remarks were made by Mr. J. K. Fisher before a recent meeting of the Polytechnic Association of the American Institute:

"The superiority of washing streets may be seen by those who observe the following facts:—1st, Fully a third of the dirt is left on the pavement by the machine and hand-brooms in Broadway. 2d, A strong shower washes the pavement clean, excepting where there are holes, in which water remains and sediment falls. 3d, In wet weather the streets are not swept, but mud accumulates for days and weeks; and the mud holds water like a sponge, and keeps the streets wet for days after the sidewalks would be dry, were the mud not tracked upon them. 4th, The best time to wash a street is while it is wet; the washing engine would then use less water. 5th, As soon as rain is over, the washing engines would do their work, and blow the dirty water out of the holes, and leave the pavement nearly dry, so that in half an hour it would be completely dry; thus saving the muddiness, which now lasts from two to six days before the contractor

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sweeps. 6th, The cost of washing by hose-jet in Sheffield was less than half the cost of sweeping and cartage; proper washing engines would further reduce the cost. The washing would make less dust than sweeping.

"Considering the mud avoided, and the little if any dust, the washing system would give more than double cleanliness, probably at half the cost of the present inefficient system. The washing engines would be efficient fire engines, and would always be ready to leave their street work instantly when fires occur; their cost would therefore be little beyond what is now incurred for engines and men, who do but few hours' work in a year.

"Floating fire-engines could dredge the docks by jet, while the tide runs outward, and thus clear the docks from the street dirt, and at the same time serve as fire engines better than if kept inactive, without steam up and their fires strong.

"Some of our sewer engineers say that the sewer gullies are not made to pass street dirt, but to catch it; and that, therefore, alterations would be required to make this proposed system practicable. Others say that much of the street dirt does go through the sewers. I am convinced, by evidence published in England, that the system is practicable with the present gullies, and that the gully traps are needed to catch the gravel that is often found in streets, and that might do harm in the sewers. Mr. McElroy's paper is good professional evidence against the hasty surmises of engineers who have not studied the subject."

DATES—AMENDMENT IN THE BRITISH CONSTITUTION NEEDED.—According to English newspapers, technical, commercial and literary, no event ever took place on the 20th of July, or the 11th of December, or at any other period absolutely defined in the statement of fact. "Messrs. Samuda launched the ironclad *Vengeance* on Thursday;" "Mr. Scott Russell yesterday lectured the Royal Institution;" "the John Bull won the ocean race, by arriving on Friday;" "a total eclipse of the sun will take place on Wednesday." In rare instances we are favored with a hint in the shape of "next" or "last," but not by polite writers. The man who hopes to be a F. R. S. would utterly ruin his chances by writing "Wednesday last;" and there is not an engineer's apprentice in Great George street who dares write "Thursday July 1st," in an article intended for publication.

Nicholas Woods, the wonderfully versatile and remarkably accurate reporter for the "Times," who does with equal elegance an armor test at Shoeburyness one day and a marriage at St. George's, Hanover Square, the next; a hanging at Old Bailey in the morning and the trial of a surface condenser at the Isle of Dogs in the afternoon—Woods is a precedent and a pillar in the British Constitution. Woods says in the "Times" that a thing happened "on Thursday," and even Colburn does'nt quite like to add "July 1st," for, independent as he may be in his professional convictions and expressions, an un-Woodsy style of reporting a fact would be as inexcusable a violation of British precedent as traveling in cars that were not locked, or crossing the channel with the decency and comfort of Long Island Sound navigation.

Seriously, this almost universal omission of dates in the English papers is as unnecessary as it is inconvenient. One has to find the date of the paper and compute the time, unless, as is often the case in newspaper offices, one happens to be reading a slip without date; but when a technical weekly or monthly copies *verbatim* from a *daily* about the trial that was completed "yesterday," or the ship that was launched on "Thursday," this affectation of the cockney-daily style becomes ludicrous as well as embarrassing.

SUBJECTS OF BRITISH LETTERS PATENT FOR 1868. Mr. George Shaw has drawn up a condensed analytical list of letters patent for inventions granted and provisional protections applied for during the year 1868. From this summary of inventive effort we subjoin an indication of the progress discernible in materials and appliances connected with building trades. In all, there were 3,991 applications. Of this large number 11 related to improvements or inventions connected with sewers, drains and cesspools; 13 with making and sweeping roads; 38 appertained to wheels for railway and other carriages; 4 to docks, breakwaters, and submerged works; 84 to furnaces and consuming fuel; 116 to railways, locomotives and railway carriages; 185 to steam engines and steam boilers; 33 to artificial fuel, matches and splints; 6 to baths; 4 to bells and bell-hanging; 2 to castors for furniture; 32 belonged to latches, hinges and springs for doors; 5 to fenders, fire-iron and fire-guards; 39 to nails, bolts, screw-nuts, and rivets and machinery for manufacturing the same; 21 related to the processes of sawing, planing, boring, etc., stone and slate; 54 to sawing, planing and turning metals, wood, etc.; 79 to telegraphs, signals and intercommunication in railway trains; 4 to surveying instruments; 14 to drawing, painting, and exhibiting pictures and photographs; 31 to windows, sashes, shutters, doors and fencing; 3 to floors and flooring machinery; 52 to tunnels, bridges, arches and portable and other buildings; 21 to lime, brick, and other kilns and coke ovens; 10 to artificial stone, plaster and cements; 30 to bricks, tiles and clay-pipes; 13 to glass manufacture; 19 to blinds, curtains and shades; 43 to stoves, grates, fire-places, kitchen ranges and culinary apparatus; 30 to warming and ventilating buildings; 11 to gas-burners; 33 to gas and water meters and regulators; 43 to cocks, taps and valves; 31 concerning pipes and tubes for steam, water and gas, and joints for the same; 21 related to water-closets and urinals; 16 to hydraulic machinery for raising and distributing water; 5 treated of the preservation and preparation of timber; and 2 apportioned to coffins, hearses, and preservation of the dead. Satisfactory as this amount of activity thus indicated may be, it appears trifling to that fermenting in men's brains on the other side of the Atlantic.—*Builder.*

THE GUIBAL FAN.—A large fan, on the Guibal principal (see Van Nostrand's Magazine, No. 1, page 43), was recently started at the Byers Green Colliery, and did good work. It was run up to 60 revolutions per minute, and at this speed produced 68,000 cubic feet of air per minute, with a water gauge of 3.10 in. The quantity of air previously got by the furnace was 11,000 cubic feet below the quantity produced by the fan, or 57,000 cubic feet. The fan has not yet been worked up to its maximum power, as it is guaranteed by the maker to work up to seventy revolutions per minute. The makers are Messrs. Black, Hawthorn & Co.. of Gateshead.

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LONG SPAN BRIDGES.—Prof. De Volson Wood has furnished the following interesting summary to the "Journal of the Franklin Institute:"

TABLE OF BRIDGES HAVING LONG SPANS.—*Trussed Bridges.*

NAME OF BRIDGE.	Total length in feet.	No. of spans.	Longest span.	REMARKS.
Schaffhausen, Switzerland	365	2	193	Weisbach Mech. vol. II, p. 283.
Trenton, N. J	880	5	200	Wooden arch trussed. Haupt on Bridge Construction, p. 242.
Columbia, Penn'a	5,280	29	200	Burr's; destroyed during rebel invasion, 1863. Mahan, p. 240.
Newark Dyke, Eng	.....	.....	240½	Longest span of Warren's Girder. Jour. Frank. Inst., vol. 26, 3d series, p. 156.
Essex, Mass	250	1	250	Mahan, Civ. Eng., p. 238.
Chepstow, Eng	606	4	306	Queen Past—Theory of Bridges—Weak.
Noget, E. Prussia	374½	2	321	Jour. Frank. Inst., vol. 39, 3d ser. p. 230.
Upper Schuylkill	.....	1	340⅛	Mahan, p. 237.
Louisville Bridge, over Ohio river,	5,201	25	370	Fink's Truss—Report of Committee.
Wettingen, Germany,	390	1	390	Erected in 1778. Longest span of wooden truss on record. Weisbach Mech. vol. II, p. 83.
Dirschau, Prussia	2,383¼	6	397¼	Iron lattice. Jour. Frank. Inst. vol. 39, 3d series, p. 230.
Kuilmburg, Holland	.....	.....	515	Longest span trussed bridge. Official report, 1866.
Derry, designed by Claus (never built)	.....	1	900	Proposed wooden structure. Weis. Mech. vol. II, p. 84.

Tubular Bridges.

NAME OF BRIDGE.	Total length in feet.	No. of spans.	Longest span.	REMARKS.
Conway, Eng	.....	1	400	Civ. Eng. Jour., 1848.
Britannia, Eng	1,513	4	460	Tubular bridges by Dempsey. Traité de la Construction des Ponts Métalliques, pl. X.
Victoria, at Montreal, Canada	10,284	25	330	Hunt's Merch. Mag., vol. XXXI, p. 504; 24 spans are each 242 feet.

Arched Bridges.

NAME OF BRIDGE.	Total length in feet.	No. of spans.	Longest span.	REMARKS.
Neuilly (over Seine)	*640	5	128	Mahan, p. 225.
Teff, South Wales	.....	1	140	Failed by rising of the crown. Woodbury on the arch, p. 432.
London Bridge	784	5	152	Woodbury, p. 432—for railr'd purposes.
Rica, Ayr	.....	.....	180	Jour. Frank. Inst., vol. 39, p. 231.
Chester or Grosnover	.....	.....	200	Mahan, p. 228.
Great Washington Aqueduct	.....	.....	200	Sc. Am. 1860, p. 86. Cast iron, by Rennie.
Southwark	.....	.....	250	Smile's Lives, Eng., vol. II, p. 188.
Trizzo Adda	251	1	251	Longest stone arch on record. Treatise on Bridges, Weale, vol. I, p. 48.
St. Louis Bridge	1,509	3	515	Not yet built. The arch to be of steel. Rep. by the Co., 1858.
Proposed bridge over the Thames, by Telford	.....	1	600	To be made of iron. Weisbach, v. II, p. 86.

* More than 640.

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Name of Bridge.	Total length in feet.	No. of spans.	Longest span.	Remarks.
Niagara Carriage Bridge	.....	1	1,264	Sc. Am., vol. XX, p. 218. This bridge is about a mile below Niagara Falls.
Cornwall (proposed to be built across the Hudson river, 42 miles above N. Y. City).....	2,409	1	1,600	Jour. Frank. Inst., vol. LVII, p. 165.

Name of Bridge.	When built.	Span.	Remarks.
Douro, at Oporto	1842	558	Sup. to Weale's Bridges, p. 144.
Menai, Eng.....	1825	580	Chain cable. Mahan's Civ. Eng., p. 255
St. John's, N. B.....	1852	622	Sc. Am., June 19th, 1862.
Nashville, over Cumberland.....	1850	656	Destroyed by rebel Gen. Floyd, Feb 1862. Sc. Am. Mar. 30th, 1850.
Pesth, over Danube	1849	670	Total length, 1250. Jour. Frank. Inst., vol. XVII, 3d series, p. 300.
Niagara Railroad Bridge.....	1854	822	Jour. Frank. Inst.
Fribourg, Switzerland.....	1834	870	Jour. Frank. Inst., vol. XXIII, 2d series, p. 141.
Lewiston (7 miles), below Niagara Falls ..	1856	1,043	Sc. Am., June 1st, 1861. Blown down Feb. 1864.
Lexington and Danville Railroad Bridge...	1856	1,220	Jour. Frank. Inst., vol. XXXIX, 3d series, p. 230.
East River Bridge, N. Y. City.....	.....	1,600	Proposed. Jour. Frank. Inst., vol. LXXXIV, p. 243.

Root's Pressure Blower.—This device is now, by general consent, here and in England, one of the best, if not the very best means of blowing cupola furnaces. A pair of reciprocating pistons afford, of course, a steady blast of any desired pressure; but they are costly to construct, and the piston packing and valves are subject to wear. No fan blower can be depended upon to give the requisite pressure, viz: half a pound to a pound per square inch—a pressure indespensable to continuous melting, as in the Bessemer manufacture. Rotatory blowers with sliding pistons or rubbing surfaces of any kind, may indeed be kept tight if constructed with sufficient cost, and carefully cleaned and lubricated. The advantage of Root's rotatory blower is that it has, strictly speaking, no rubbing surfaces. The floats, or rotatory pistons, are so shaped that the projections of the one exactly fit into the hollows of the other, without the need of sliding vanes. There is of course a very thin space between the floats, through which a thin film of air leaks back, but this loss is reduced to a minimum by means of a stiff paint or plaster of black lead and tallow, which is applied to the floats and soon moulds itself to fill the spaces that would otherwise promote excessive leakage. But, as in all other machinery with which we are acquainted, the best materials and workmanship pay best in the long run. The shrinkage or the loosening of the wood forming the floats, by reason of improper seasoning or fastening, soon cause excessive friction as well as leakage. Perfectly seasoned wood floats, secured as well as they *can* be to steel shafts and cut gearing, certainly answer well; this we know from experience with not less than three of these blowers, of the largest sizes. At the same time, we think the extra cost of cast-iron floats, planed or dressed by special tools and gauges to a perfect fit, and revolved by several sets of wide-faced cut gears, so as to avoid back lash and wear, would pay. The power wasted in driving a noisy or leaky blower, would cost more than the most accurate construction.

Elastic Collodion Cement.—Ordinary collodion is made by dissolving eight parts of gun-cotton in one hundred and twenty-five parts of ether and eight parts of alcohol. When used as a cement or varnish it becomes very hard, cracks easily, and peels off. It may be rendered elastic by the addition of four parts of Venetian turpentine and two parts of castor-oil. When intended for surgical purposes, as a varnish, which when dry forms a perfectly close-fitting plaster, it has been found that the addition of some glycerine to the ordinary collodion, in which it is dissolved to a small extent, makes a varnish which adheres strongly to the skin, does not crack, and, on account of its elasticity, does not crease the skin.

Wire-Rope Transport.—The practical value of the wire-rope transport system, invented by Mr. C. Hodgson, C. E., (see V. N's. Mag. Vol. I, p. 334,) is now being recognized by those engaged in working mines. Sir G. S. Robinson has given an order to the Wire Tramway Company to construct one of their patent ways, for carrying iron ore from his quarries to the Cransford Station.

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Artificial Stone.—Mr. Hodgsol, the proprietor of four patents on artificial stone, exhibited his process for manufacturing this stone at a late meeting of the Polytechnic Association of the American Institute. The stone consists of sand cemented together by means of oxalate of lime. The inventor takes two or three parts of sand to one of lime, or rather lime slacked with a solution of oxalic acid. The materials are carefully mixed and then pressed in a mould, where they quickly set. The articles are then transferred to a bath containing a solution of oxalic acid, where in a short time they become hard. Oxalic acid forms with lime a compound of great insolubility. Indeed, the oxalate is the most insoluble of all the salts of lime. A great deal has been said about the superiority of the cements made by the ancients. This is due partly to the influence of time, and partly because the poor cements have disappeared. When lime and sand are left in contact for many years a chemical union takes place, and a true silicate of lime is formed. Hydraulic cement requires the presence of alumina. The Rosendale cement contains carbonate of lime with silica, alumina and magnesia. The French, in making the Suez Canal, employ the mud of the lakes, the sand of the desert and lime, which they mix, bake in the sun and use for the construction of piers, etc., without the application of any fire. This stone is about equal in hardness to Cayenne stone.

Electro-magnetic Engines on Board Ship.—Mr. John Tawse writes to "The Engineer" as follows: Some years ago, when in India, I had a boat on one of the salt lakes of the Coromandel coast, and from experiments I then made I became impressed with the idea that there is an immense mechanical power lying dormant in the simple and natural *galvanic action of salt water on the sheathing of vessels*. Electro-magnetism has hitherto failed as a motive power on the score of economy only. The form of battery used is too expensive, owing to the use of strong acids acting upon a comparatively small surface. Also in this case the electric current is deficient in quantity for mechanical purposes. What seemed to be wanted was a very large area of metallic surface, acted upon by an excitant strong enough to evolve a powerful current, yet not sufficiently so to wear or corrode the plates in a very perceptible degree. I have since published the idea which this gave birth to in several of our scientific journals. But as I have now worked it out to completion, both by calculation and experiment, I detail it herein for the information of your readers.

A vessel to be fitted with an electro-magnetic engine attached to an ordinary shaft, is sheathed on one side with copper, and on the other side with zinc. The sheathing is laid on over sheets of gutta percha in order to insulate it from the woodwork of the vessel. The nails necessary for this purpose are driven in such a manner that they are nowhere in metallic contact with any part of the sheathing. The two sections of copper and zinc sheathing thus form a battery, acted upon and excited by salt water alone. If any one acquainted with the subject will calculate the result of galvanic action on so large a surface as the area of immersion of a floating vessel, they will perceive that it is the right application of it alone that is wanted to convert it into a powerful mechanical force.

The vessel being so sheathed, a wire from each section of course conducts the current to the electro-magnetic engine. In my first experiments I had a large magnet to work a keeper in connection with a crank in the usual way. Since then I have adopted a mode of multiplying the power enormously. Thus the wires are connected with a thick, small-sized electro-magnet in the first instance. In front of its two poles an armature is made to rotate with great velocity, and the augmented current thus produced is carried to an arrangement of two very large magnets working reciprocally in such a way that the keeper, or soft iron beam between them, which works the crank axle of the screw, flows the current into each separately at every stroke, charging it just before the moment of contact. As regards the wear of the plates, it would be no greater than in the case of ordinary sheathing, with this advantage, that no sea-weed or barnacles would adhere to sheathing in constant galvanic activity; ordinary copper sheathing would be quite free from them if the galvanic circle were complete. In fitting the above engine to a vessel the rotating armature working before the first magnet would have to be driven by a small steam engine.

On the Cost of Waterwheels in England. Mr. Robert Sanders writes to the "Mining Journal" as follows: After fifteen years' practical experience in working all kinds of mining machinery by waterwheels, I am prepared to assert that a wheel 10 ft. in diameter, 3 ft. breast, should not cost about 10*l*.; one of 24 ft. diameter, 4 ft. breast, 120*l*.; or one of 40 ft. diameter, 3 ft. breast, 220*l*. I will quote one instance just to show something about the price of waterwheels. At the Carmarthen United Lead Mines, in South Wales, I had two wheels erected, one of 34 ft. diameter, 3 ft. breast, with cast-iron axles, centers and shrouding; the arms, soling and buckets were of yellow pine; there were also the crank-pin and connecting-joint for sweep rod. The other was 24 ft. diameter, 4 ft. breast, with cast-iron axle centers and shrouding; the arms, soling and buckets were of red, or pitch, pine; also crank-pin, connecting-joint, etc. Both of these wheels were made per contract. The cost of each, including erection, was as follows: 34 ft. diameter, 164*l*. 10s.; 24 ft. diameter 119*l*. 10s. The latter, including wheel-pit, etc., when ready to work, cost altogether 144*l*. The former had no wheel-pit, but worked on a frame, like a grindstone, made of American pine log, and the whole expense when ready to work did not exceed 230*l*.

How to Test the Lubricating Power of Oil. It is a matter of importance to the mechanic to be able to say what amount of friction a particular oil can overcome as compared with another oil. This is done by an apparatus called an "oil-tester," of which a new form, devised by Mr. T. R. Shaw, is thus described: On a vertical shaft fitted in bearings is fixed a disc, on the upper surface of which rests a circular or partly circular block, the two surfaces in contact being preferably finished as true plans. The lower disc is caused to revolve rapidly by suitable means, the continued rotation of the block being prevented by a cord, one end of which is attached to the side of the block, the other end being attached to a spring balance, or to a weighted and gradual lever. The block is kept in position

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on the revolving disc by means of anti-friction bowls, which are so applied as not to interfere with the rotation of the block. A thermometer is fixed in the center of the block. A small portion of the lubricant to be tested is applied to the disc, the metal block is placed in position, and the lower disc is caused to revolve until a certain temperature which has been fixed upon as suitable for all seasons, as for example 70° Fahr., is indicated by the thermometer, when the test of the oil is commenced by noting the frictional resistance indicated on the scale of the spring balance, readings being taken from the scale at intervals during the continuance of the experiment.—*Scientific Opinion.*

THE VELOCIPEDE AS A MECHANICAL AGENT.—The practical value of the velocipede as a means of locomotion has been thoroughly discussed in a well-considered paper by Mr. Lauder, C. E., read before the Liverpool Polytechnic Society. As advantages and disadvantages of bicycles, tricycles, etc., are very equally balanced as compared with each other, Mr. Lauder's conclusions may be considered to apply equally to all kinds of velocipedes. The velocipede possesses *no* advantage; that is to say, a man can, with equal exertion, walk or run quite as far in a day of eight hours as he can travel with a velocipede in the same time. Mr. Lauder, being a velocipedest himself, has given the velocipede all the advantage in the argument that was at all possible; yet he can only show that, although for a journey of a few minutes duration a speed of 24¼ miles per hour may be obtained, no more than 30 miles in the day of eight hours can be traversed. Mr. Lauder is of opinion that, as a means of traveling, the velocipede has very little chance of coming into use, although as an instrument of healthful exercise it is worthy of consideration.—*Builder.*

SPEED IN TRAVEL.—In a single second a snail travels one five-thousandth of a foot; a fly five feet; a pedestrian, at ordinary gait, five and three-tenths feet; a camel six feet; an ordinary breeze ten feet; a rapid running stream twelve feet; a trotting horse twelve feet; a whale twelve and three-tenths feet; a fast-sailing ship fourteen feet; a reindeer, with sledge, twenty-five feet; a locomotive engine twenty-nine feet; a skater thirty-six feet; a race-horse forty-one feet; a tempest fifty feet; a swiftly thrown stone fifty feet; an eagle ninety-five feet; a carrier-pigeon four hundred and eleven feet; a rifle ball one thousand five hundred and ninety-five feet; a twenty-five pound cannon ball two thousand two hundred and ninety-nine feet; a point of the earth on the equator two thousand four hundred and fifty-one feet; the center of the earth around the sun four miles; a ray of light one hundred and ninety-five thousand miles.

ATMOSPHERIC SIGNAL FOR SHIPS.—Messrs. MacIver and Co. have introduced Messrs. Wier and Co.'s atmospheric telegraph signals into the Scotia and other large steamers of their fleet. The apparatus may be briefly described as consisting primarily of a small air-chamber to which air has perfect access. In this chamber an elastic disc is placed which, acted on by a lever, compresses the air in the chamber and propels it through a metallic tube of small diameter to any part of the ship with which it is considered desirable to communicate. The air so propelled rings a signal bell in the first instance to secure attention to the signal transmitted; the action of the transmitted air at the same moment that it strikes the bell lifts a small and delicate opaque shutter, revealing under it the word or words of the intended order. The chief point where directions must be given is the locality in which the commander of the vessel is placed, such as the bridge in the case of an ocean-going steamer. Here the handle of the instrument is placed, the whole revolving on a pivot, so that the handle is pressed down to the point which will indicate at a distance the command issued. This is guided in the mode of working by a dial inscribed with the words intended to be communicated.

PROPOSED CANAL BETWEEN THE BAY OF BISCAY AND THE MEDITERRANEAN.—The project of establishing through the Valley of the Garonne (France) a canal for large navigation has often been mooted; but there is now a new plan for this undertaking, under the auspices of M. Staal de Magnancourt. The proposed canal will admit not only merchant ships of the heaviest tonnage, but also men-of-war and transatlantic steamers. A port is to be established in the Gironde, just below Bordeaux, and another on the Mediterranean. The cost of the scheme is estimated at 442,000,000f., and the cutting of the canal would occupy six years. The plan, if carried out, will materially shorten the navigable communication between England, the north of Europe, and India, for it will in fact be a continuation of the canal of Suez.

THE FAST VOYAGE OF THE SCOTIA.—The Cunard mail paddle-steamer Scotia still continues to maintain her supremacy on the Atlantic. Her last passage from New York to Liverpool was one of the shortest on record, she having made the run to the Mersey, including detention at Queenstown, but allowing 4 hours 40 minutes for difference of time, in 9 days and 19 minutes. She had S. S. W. wind on the day of sailing and afterwards moderate easterly breezes throughout. On the 13th she had logged 254 miles, 14th 326, 15th 330, 16th 322, 17th 31, 18th 641, 19th 340, 20th 320, 21st, to noon, 339, being an average speed of nearly 14 knots an hour. The engines of the Scotia are of great power, and with moderate winds she leaves all competitors far in the distance. The Inman screw steamer City of Paris and the Cunard screw steamer Russia are the only two ships which at all approach her in point of speed.—*Engineering.*

IRON SHIP BUILDING IN NEW YORK.—An estimate was recently obtained by a New York shipping firm, for the building of a first-class iron sailing vessel in this country, but it now appears that the vessel is to be built in New York, more favorable terms having been obtained there, and that only the wire rigging, anchors and chain cables, are to be supplied from England. This, we understand, will be the first American built iron sailing vessel to cross the Atlantic.—*Mechanics' Magazine.*

NEW FAIRBAIRN ENGINES.—The Fairbairn Engineering Company have now in hand, and will be shortly ready to exhibit, a set of 60-horse engines, constructed upon an entirely new principle, which, besides possessing other important advantages, will consume probably less than half the quantity of coals required by the best steam engines at present in use.—*British Enthusiast.*

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